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10/589,215	09/07/2006	Ulrich Bischofberger	BISCHOFBERGER-8 PCT	8398
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COLLARD & ROE, P.C.			EXAMINER	
1077 NORTHERN BOULEVARD			FOGARTY, CAITLIN ANNE	
ROSLYN, NY 11576				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/589,215	<b>Applicant(s)</b> BISCHOFBERGER, ULRICH
	<b>Examiner</b> CAITLIN FOGARTY	<b>Art Unit</b> 1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If no period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133).

Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on **24 February 2010**.

2a) This action is **FINAL**.      2b) This action is non-final.

3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) **16-34** is/are pending in the application.

4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5) Claim(s) **17-27,29 and 30** is/are allowed.

6) Claim(s) **16,28 and 31-34** is/are rejected.

7) Claim(s) \_\_\_\_\_ is/are objected to.

8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.

10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) All    b) Some \* c) None of:

1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

1) Notice of References Cited (PTO-892)

2) Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) Information Disclosure Statement(s) (PTO/SB/06)  
Paper No(s)/Mail Date \_\_\_\_\_

4) Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_

5) Notice of Informal Patent Application

6) Other: \_\_\_\_\_

**DETAILED ACTION**

***Status of Claims***

1. Claims 16 – 34 are pending where claims 17 – 21, 23 – 25, 29, and 30 have been amended and claim 34 is new. Claims 1 – 15 have been cancelled.

***Status of Previous Rejections***

2. The 35 U.S.C. 112 first paragraph rejection of claim 30 is withdrawn in view of the amended claims filed February 24, 2010.

The 35 U.S.C. 112 second paragraph rejection of claims 29 and 30 is withdrawn in view of the amended claims filed February 24, 2010.

The 35 U.S.C. 103(a) rejection of claims 16, 18, 19, and 21 – 27 as being unpatentable over Lee et al. (US 6,419,769) in view of Schmid et al. (US 5,178,686) and further in view of Volume 14 of the 1988 9<sup>th</sup> Edition *ASM Handbook* has been withdrawn in view of the arguments and amended claims filed February 24, 2010.

The 35 U.S.C. 103(a) rejection of claims 17 and 28 as being unpatentable over Lee et al. (US 6,419,769) in view of Schmid et al. (US 5,178,686) and further in view of Volume 14 of the 1988 9<sup>th</sup> Edition *ASM Handbook* and further in view of Volume 7 of the 1998 9<sup>th</sup> Edition *ASM Handbook* has been withdrawn in view of the arguments and amended claims filed February 24, 2010.

The 35 U.S.C. 103(a) rejection of claims 31 – 33 as being unpatentable over Adam et al. (US 4,917,739) has been maintained.

***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Claim Rejections - 35 USC § 103***

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 16 and 34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 6,419,769) in view of Schmid et al. (US 5,178,686) and further in view of Volume 4 of the 1991 *ASM Handbook*.

With respect to instant claim 16, col. 4 lines 40-61 of Lee teach a method for production of a high-strength material. The method of Lee comprises producing a block of an aluminum based alloy. Then, the block is subjected to heat treatment consisting of solution heat treatment, quenching, and artificial aging.

Lee differs from instant claim 16 because it does not teach an aluminum-based alloy with a composition that overlaps with the composition recited in the instant claim. However, col. 2 lines 24-68 of Schmid teach an aluminum-based alloy with an overlapping composition. The alloy of Schmid has a composition of up to 15 wt% Si, up to 5 wt% Cu, 5-25 wt% magnesium silicide (1.73 x Si), and the remainder aluminum, where the silicon may be replaced entirely or in part by magnesium in an amount of up to 15 wt% (m). Therefore, the compositions of Si, Mg, Cu, and Al in the alloy of Schmid overlap with the compositions of Si, Mg, Cu, and Al in instant claim 16. The formula in claim 16 is also satisfied by the alloy of Schmid where the term "1.73 x Si" is satisfied by

the composition of magnesium silicide and the term "m" is satisfied by the fact that the silicon may be replaced entirely or in part by magnesium in an amount of up to 15 wt%. Furthermore, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those ordinary skilled in the art. *In re Austin, et al.*, 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to use the aluminum-based alloy of Schmid in the method of Lee in order to produce a piston for an internal combustion engine with improved properties that is lightweight, reduces the fuel consumption and the emission of pollutants, and has a high carrying capacity (see col. 1 lines 8-17 of Schmid).

Lee also differs from instant claim 16 because it does not teach the step of hot-forming the base alloy block into a hot-formed element in at least one hot-forming step subsequent to the producing step. However, it would have been obvious to one of ordinary skill in the art to subject the base alloy block of Lee to hot-forming in at least one hot-forming step subsequent to the producing step and before heat treatment in order to create a desired shape of the alloy because it is well known in the art to hot-form aluminum alloys at least once after forming an ingot in order to create a desired shape followed by heat treatment of the aluminum alloy as evidenced by p. 1-3 of Volume 4 of the 1991 *ASM Handbook*.

In regards to instant claim 34, col. 4 lines 40-61 of Lee teach a method for production of a high-strength material. The method of Lee comprises producing a block of an aluminum based alloy. Then, the block is subjected to heat treatment consisting of solution heat treatment, quenching, and artificial aging.

Lee differs from instant claim 34 because it does not teach an aluminum-based alloy with a composition that overlaps with the composition recited in the instant claim. However, col. 2 lines 24-68 of Schmid teach an aluminum-based alloy with an overlapping composition. The alloy of Schmid has a composition of up to 15 wt% Si, up to 5 wt% Cu, 5-25 wt% magnesium silicide ( $1.73 \times Si$ ), and the remainder aluminum, where the silicon may be replaced entirely or in part by magnesium in an amount of up to 15 wt% (m). Therefore, the compositions of Si, Mg, Cu, and Al in the alloy of Schmid overlap with the compositions of Si, Mg, Cu, and Al in instant claim 34. The formula in claim 34 is also satisfied by the alloy of Schmid where the term “ $1.73 \times Si$ ” is satisfied by the composition of magnesium silicide and the term “m” is satisfied by the fact that the silicon may be replaced entirely or in part by magnesium in an amount of up to 15 wt%. Furthermore, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of elements would appear to require no more than routine investigation by those ordinary skilled in the art. *In re Austin, et al.*, 149 USPQ 685, 688. It would have been obvious to one of ordinary skill

in the art to use the aluminum-based alloy of Schmid in the method of Lee in order to produce a piston for an internal combustion engine with improved properties that is lightweight, reduces the fuel consumption and the emission of pollutants, and has a high carrying capacity (see col. 1 lines 8-17 of Schmid).

Lee also differs from instant claim 34 because it does not teach the step of hot-forming the base alloy block into a hot-formed element in at least one hot-forming step subsequent to the producing step. However, it would have been obvious to one of ordinary skill in the art to subject the base alloy block of Lee to hot-forming in at least one hot-forming step subsequent to the producing step and before heat treatment in order to create a desired shape of the alloy because it is well known in the art to hot-form aluminum alloys at least once after forming an ingot in order to create a desired shape followed by heat treatment of the aluminum alloy as evidenced by p. 1-3 of Volume 4 of the 1991 *ASM Handbook*.

Since the claimed compositional ranges of claims 16 and 34 either overlap or are within the ranges disclosed by Schmid, a *prima facie* case of obviousness exists. See MPEP 2144.05. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed aluminum alloy composition from the aluminum alloy composition disclosed by Schmid because Schmid teaches the same utility (i.e. aluminum alloy for an internal combustion engine component) in the whole disclosed range.

6. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (US 6,419,769) in view of Schmid et al. (US 5,178,686) and further in view of Volume

4 of the 1991 *ASM Handbook* and further in view of Volume 7 of the 1998 9th Edition *ASM Handbook*.

With respect to instant claim 28, col. 4 lines 40-61 of Lee teach a method for production of a high-strength material. The method of Lee comprises casting a block of an aluminum based alloy. Then, the block is subjected to heat treatment consisting of solution heat treatment, quenching, and artificial aging.

Lee differs from instant claim 28 because it does not teach an aluminum-based alloy with a composition that overlaps with the composition recited in the instant claim. However, col. 2 lines 24-68 of Schmid teach an aluminum-based alloy with an overlapping composition. The alloy of Schmid has a composition of up to 15 wt% Si, up to 5 wt% Cu, 5-25 wt% magnesium silicide ( $1.73 \times Si$ ), and the remainder aluminum, where the silicon may be replaced entirely or in part by magnesium in an amount of up to 15 wt% (m). Therefore, the compositions of Si, Mg, Cu, and Al in the alloy of Schmid overlap with the compositions of Si, Mg, Cu, and Al in instant claim 28. The formula in claim 28 is also satisfied by the alloy of Schmid where the term " $1.73 \times Si$ " is satisfied by the composition of magnesium silicide and the term "m" is satisfied by the fact that the silicon may be replaced entirely or in part by magnesium in an amount of up to 15 wt%. Furthermore, it is well settled that there is no invention in the discovery of a general formula if it covers a composition described in the prior art, *In re Cooper and Foley* 1943 C.D. 357, 553 O.G. 177; 57 USPQ 117, *Taklatwalla v. Marburg*, 620 O.G. 685, 1949 C.D. 77, and *In re Pilling*, 403 O.G. 513, 44 F(2) 878, 1931 C.D. 75. In the absence of evidence to the contrary, the selection of the proportions of elements would appear to

require no more than routine investigation by those ordinary skilled in the art. *In re Austin, et al.*, 149 USPQ 685, 688. It would have been obvious to one of ordinary skill in the art to use the aluminum-based alloy of Schmid in the method of Lee in order to produce a piston for an internal combustion engine with improved properties that is lightweight, reduces the fuel consumption and the emission of pollutants, and has a high carrying capacity (see col. 1 lines 8-17 of Schmid).

Lee also differs from instant claim 28 because it does not teach the step of hot-forming the base alloy block into a hot-formed element in at least one hot-forming step subsequent to the producing step. However, it would have been obvious to one of ordinary skill in the art to subject the base alloy block of Lee to hot-forming in at least one hot-forming step subsequent to the producing step and before heat treatment in order to create a desired shape of the alloy because it is well known in the art to hot-form aluminum alloys at least once after casting an ingot in order to create a desired shape followed by heat treatment of the aluminum alloy as evidenced by p. 1-3 of Volume 4 of the 1991 *ASM Handbook*

Lee in view of Schmid and further in view of Volume 4 of the *ASM Handbook* differs from instant claim 28 because it does not teach that the producing step comprises spray compacting a block of aluminum-based alloy. However, it would have been obvious to one of ordinary skill in the art to produce the base alloy block by spray compacting in the method of Lee in view of Schmid and further in view of Volume 14 of the *ASM Handbook*, rather than casting as disclosed in Lee, in order to produce an aluminum alloy product with low oxygen and hydrogen levels and a refined uniform

microstructure in order to optimize the mechanical properties of the alloy because it is well known in the art that spray compacting creates aluminum alloys with those properties as evidenced by p. 396-397 of Volume 7 of the 1998 9<sup>th</sup> Edition ASM *Handbook*.

Since the claimed compositional ranges of claim 28 either overlap or are within the ranges disclosed by Schmid, a *prima facie* case of obviousness exists. See MPEP 2144.05. It would have been obvious to one of ordinary skill in the art at the time the invention was made to select the claimed aluminum alloy composition from the aluminum alloy composition disclosed by Schmid because Schmid teaches the same utility (i.e. aluminum alloy for an internal combustion engine component) in the whole disclosed range.

7. Claims 31 – 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Adam et al. (US 4,917,739).

Adam is applied to claims 31 – 33 as set forth in the November 23, 2009 Office action. No claims have been amended.

***Allowable Subject Matter***

8. Claims 17 – 27, 29, and 30 are allowed.

***Response to Arguments***

9. Applicant's arguments, see p. 10-13, filed February 24, 2010, with respect to the rejection(s) of claim(s) 16 under 35 U.S.C. 103(a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further

consideration, a new ground(s) of rejection is made in view of Volume 4 of the 1991 *ASM Handbook*.

10. Applicant's arguments filed February 24, 2010 in regards to claims 16 and 31 – 34 have been fully considered but they are not persuasive.

*Arguments are summarized as follows:*

- a. Lee teaches away from Schmid because an aluminum alloy with a significantly higher level of magnesium in the aluminum alloy will result in a lower strength. Therefore, a person skilled in the art would not combine a material containing a high level of Mg as claimed in claim 16, with the heat treatment steps of Lee.
- b. Regarding claims 31-33, Adam suggests an Al alloy containing at least one of group Fe, Co, Ti, V, Ni, Zr, Cu, Mg and Mn with a wt% of 2.1-20 and an aluminum balance. The claimed alloys of claim 31, however, all contain less than 2.1 wt% Fe and L1 and L3 contain less than 2.1 wt% Cu. Therefore, the claimed alloys according to claim 31 are patentable over Adam.
- c. In regards to new claim 34, the claimed alloy is not within the suggested range of Schmid because Schmid mentions a very broad range of aluminum alloys including an addition of magnesium, but suggests to preferably add an amount of 5-12 wt% of magnesium to the alloy. This teaches away from the invention, since the addition of Mg according to the examples in the invention ranges from 2.1 (example 2) to 3.2 (example 1), which is a much lower amount for a secondary additional component.

*Examiner's responses are as follows:*

a. The Examiner relied on Lee for the disclosed method and on Schmid for the disclosed aluminum alloy composition. However, Lee teaches a method for high strength aluminum alloy with a similar composition. The Examiner maintains the position that it would have been obvious to one of ordinary skill in the art to use the aluminum-based alloy of Schmid in the method of Lee in order to produce a piston for an internal combustion engine with improved properties that is lightweight, reduces the fuel consumption and the emission of pollutants, and has a high carrying capacity (see col. 1 lines 8-17 of Schmid). Lee does not teach away from the claimed aluminum alloy composition or the aluminum alloy composition of Schmid but merely teaches that a significantly higher level of magnesium in the aluminum alloy will result in lower strength of the alloy which is not the purpose of Lee. Therefore, it would have been obvious to one of ordinary skill in the art that an aluminum alloy with a significantly higher level of magnesium than taught by Lee would have a lower alloy strength than that of the aluminum alloy of Lee.

b. Adam teaches in col. 1 lines 12-20 and col. 3 lines 5-20 an aluminum-based alloy comprising 2-20 wt% of at least one element selected from the group consisting of **Fe**, Co, Ti, V, Ni, Zr, **Cu**, **Mg** and Mn, 2.1-20 wt% **Si**, and the balance aluminum and inevitable impurities. The composition of the aluminum-based alloy of Adam overlaps with the composition of the alloy L1 recited in instant claim 31. The Examiner interprets "2-20 wt% of at least one element

selected from the group consisting of **Fe**, Co, Ti, V, Ni, Zr, **Cu**, **Mg** and Mn" to mean that the individual composition of Fe or Cu, for example, may be less than 2 wt% as long as the total composition of the "group consisting of..." is in the range of 2-20 wt%. Therefore, the Examiner maintains the position that the composition of the Al-based alloy of Adam overlaps with the composition of the alloy L1 recited in instant claim 31.

c. The Examiner has relied on the broadest teachings of Schmid in col. 2 lines 24-68 which teach an aluminum alloy with a composition that overlaps with the composition of the instant alloy as set forth in the above rejections. The scope of Schmid is not limited to the specific embodiments it teaches. See MPEP 2123.

#### ***Conclusion***

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAITLIN FOGARTY whose telephone number is (571)270-3589. The examiner can normally be reached on Monday - Friday 8:00 AM - 5:30 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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